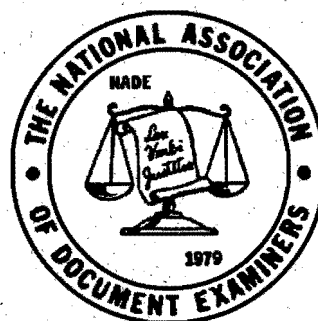


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JOURNAL OF THE NATIONAL ASSOCIATION OF DOCUMENT EXAMINERS

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EDITORIAL BOARD

Emily Will, M.A., CDE
J. Wright Leonard, CDE
Kay Micklitz, CDE
Willa Smith, CDE

From the Editors:

Welcome to the first issue being published by your new editorial board. We (Emily Will, Kay Micklitz, Willa Smith and J. Wright Leonard) would like to introduce ourselves, state our intentions regarding the journal, and lay out our policies and guidelines for you.

Emily Will is our Chief Editor and has 12 years of experience as a document examiner. She has an MA in Guidance and Counseling from Syracuse University. Emily joined NADE in 1996 and earned her CDE in 1997. Her QDE website, posted in October of 1995, was among the first QDE sites on the Internet and has brought her cases as distant from North Carolina as Texas, Utah and California. She has testified in state and federal courts and been appointed by both state and federal courts to examine documents.

Willa Smith is our Proof Editor. She has a doctorate in Educational Psychology from the University of Massachusetts, where her research revealed connections between handwriting and creativity. A former teacher, she has lectured and written articles on handwriting analysis, document examination, research, and language usage. Willa has served as proof editor for the Forensic Examiner (ABFA), and as co-editor of the Human Graphics Center newsletter and the NADE Journal. Recently she testified in court as an expert in language and grammar as part of a high profile case. Willa was certified by NADE in 1992.

Kay Micklitz is our Publishing Editor. Kay holds a Paralegal certificate from the University of Texas, San Antonio and has an extensive background in civil litigation. Kay is a certified instructor for the Texas Police Officers and Private Investigators. She joined NADE in 1995 and earned her CDE in 1997. Kay completed studies through the National Questioned Document Association, the American Institute of Applied Science for Questioned Documents and Police Photography; and has trained in Statement Analysis techniques. She is court qualified, having testified in Texas courts and in New York.

J. Wright Leonard is our Research Editor and was one of the first members of NADE, joining in 1981. She was first court qualified as an expert witness in 1983 and is a member of the IAI (NYS Division), the Association of Certified Fraud Examiners, and the Evidence Photographers International Council. Certified by NADE and the ACFE, she operates from her office in Philadelphia; has been retained by clients throughout Eastern United States; and has lectured on handwriting identification and fraudulent documents before such organizations as the American Dental Association and the Association of Certified Fraud Examiners.

The NADE Journal is an official publication of the National Association of Document Examiners. As the editors, we accept the responsibility of publishing a professional journal. We view it as our job to set editorial policy, solicit and review articles, work with authors on revisions, deliver the material in proper form to the printer, and oversee the publication and distribution process.

On the final pages of this and every issue you will find guidelines for submission of articles. We expect that establishing publishing and submission guidelines will allow authors to visualize how their articles will look in advance, make our workload lighter, and clear up any confusion for potential authors regarding what must be submitted.

The NADE Journal is your journal. If you think about it only four times a year when it arrives in your mailbox, you are missing a professional opportunity. Only by your participation will the Journal continue to grow. You may not be ready to write an article, but you could think about areas of Document Examination that hold special interest for you and work toward having something to share with others in those areas. Another way to participate is to contact the editors with suggestions for articles, and to be alert to potential authors and articles that may appear in your professional life.

Most of the articles in this issue originated to some extent at the conference in New Orleans. Beryl Gilbertson's presentation on Tremor whet everyone's appetite for more information on this topic, and Ms. Gilbertson has agreed to write a series of articles for us. "A" is for Alcohol, and that is the topic she has chosen for this first article.

Phyllis Cook's talk on Comparison of Cursive and Printscript was just the tip of the iceberg on this topic, and she has expanded the talk into a thorough article on the subject. Phil is also helping us to bring back the once popular "Do You Know?" Column with a new name, "Forensically Speaking." We welcome your contributions.

Many of us first learned about the new Doar system of Courtroom Reporting from Jeanette Hunt's conference presentation. In the past month she has visited the newly equipped courtroom and attended a trade show where Doar was exhibiting. She shares those experiences with us in her article.

Emily Will's article on the use of the digital camera to differentiate between inks is the result of her comprehension that the camera has such possibilities during a conference workshop lead by Dick McEvoy.

A very well received talk at the conference was The Honorable Michael Bagneris' speech entitled "Experts in the Courtroom." The members attending thought it was so significant that someone asked Judge Bagneris if he would allow us to reprint it in our Journal, and he graciously agreed.

Anthony McAloney's article, "Proving Photocopy Forgery" departs from this general theme of conference-based topics, but it is an important article that should be made available now.

In the future we will continue to base the first issue of the journal after each annual conference upon the presentations made there. Many thanks to Marcel Matley for suggesting this concept. With this approach, both our conference contents and journal contents will become more valuable to NADE members, which is the reason for both in the first place.

Emily Will,
Chief Editor

HANDWRITING AND ALCOHOL

by

Beryl Gilbertson, M.A., C.Crim.

ABSTRACT: This paper points out the difficulty of explaining the reasons for an opinion that a writing shows effects of alcohol intoxication or withdrawal, and the lack of adequate information available within the forensic literature. It discusses major aspects of physiologic dysfunction which occur as a function of alcohol ingestion and how these can be related to recognized disturbances of handwriting. It suggests that supporting evidence from the scientific disciplines, which is easily obtainable, can be applied in court to answer the question: "How do you support your findings?"

The Case

Opposing counsel to document examiner: "You say these two signatures were written by the same person, but they look very different to me. How do you explain that?"

Examiner: "Well, he must have written this one while sober and this other one while under the influence of alcohol — I have been told he is a very heavy drinker".

Counsel: "But you don't know that he wrote it while intoxicated, do you?"

Examiner: "Well, no, but I do know alcohol makes the signature wider and less precise...."

Counsel: "I often write my name wider and less precisely - and I never touch alcohol - so how do you explain your findings - what support do you have for your opinion? You're just guessing, aren't you?"

And that, in this fictitious but plausible dialogue, exposes the most difficult problem

facing examiners of handwriting — how do you explain your findings? As an expert witness, the examiner has the burden to fulfill the requirements of the 1923 *Frye v. United States* guideline, which says, in effect, that when direct experimental support is not available, expert testimony deduced from scientific principles or discoveries is acceptable, provided that the reference material from which it is deduced is generally accepted within the particular field or discipline from which it derives (Saferstein, 1987).

In any investigation involving the effects of alcohol upon handwriting, the "particular field or discipline" can be any or all of several fields and disciplines. Alcohol produces known effects upon the physiology and chemistry of the human body, with resulting functional problems which are well documented. Handwriting is a massively complex organization of many functional systems within the human brain, and it uses many of those same areas which are affected by alcohol.

The only way one can properly explain a finding of possible alcohol effect upon handwriting is to understand how the known effects of alcohol operate and how these, in turn, affect the production of the writing.

Source literature of forensic handwriting identification offers little help to the examiner. Osborn (1929), Conway (1959), and Bradford and Bradford (1992) do not mention alcohol at all; Harrison (1958) discusses only alcohol spirits used to detect dyestuff in pencil and/or to dissolve oils in paper; Hilton (1982) notes that signatures are sometimes normal when the writer is intoxicated and individuals are affected to varying degrees. He gives a vague description of what may be found in alcohol-affected signatures, with no explanation.

Today, more than ever before, explanations are required as both professionals and laymen become increasingly aware of the need for proper supporting evidence for any given opinion. It is not enough to say: "He must have been drunk." In these days of scientific testimony, one must be able to give reasons why, supported by reputable, accepted sources. One must be able to explain how the intoxication affects handwriting. In the case of alcohol, one must also know how withdrawal from alcohol affects it, as this, too, is an abnormal state in the writer.

Because alcohol can be given to subjects without legal sanction, a number of studies of drunken handwriting performance exist, but the findings are described, rather than explained, as is true for such studies as those of Hilton (1969) and Rabin and Blair (1953). This is because handwriting processes are not commonly understood outside of certain areas of the neurosciences. For well supported explanations, one must look at the controlled studies which have tested alcohol in relation to those areas of functioning which are also used in handwriting - linguistic, visual, perceptual, motor, spatial, and others.

Individual differences and situations, as well as ingestion of mixtures of drugs with alcohol, the development of various degrees of tolerance and/or habituation, and the fact that alcohol-dependent subjects show significantly different results from non-alcoholic subjects, tend to complicate matters. However, regardless of cause, the underlying processes remain the same, and that makes it possible to determine some of the specific writing disturbances which commonly occur.

Alcohol is a solvent and central nervous system depressant, similar in its action to sedative-hypnotics. It exerts its primary effects upon the lower levels of the brain,

where the activity of the thalamic structures and limbic system are the first to be depressed, and this slowing of brain activity spreads as intoxication increases (Julien, 1981).

In non-alcoholics, even a low blood-alcohol level will make a person's reaction time significantly slower, and increased consumption increases the delay (Julien, 1981), which can be exacerbated by tiredness (Corfitson, 1982). However, motor speed is reduced only at high doses (Hartman, 1988).

This has been found in handwriting (Tripp et al, 1959; Hilton, 1969), where the speed of forward momentum of the writing was maintained even when the writer was obviously intoxicated.

This combination of slowed reaction time with normal forward speed explains the larger size and wider lateral spread of writing, which is so consistently found (Puri, 1946; Hilton, 1969; Brun and Reisby, 1971; Foley and Miller, 1979). To explain this, one can compare it with driving a car at a constant speed. With normal reaction times, the driver sees a turn ahead and carries out the movements to turn at the right place and time. A drunken driver, with slowed reaction times, sees the turn ahead, but is slow in carrying out the necessary movements, so the car, still going at constant speed, does not turn at the right place or time.

Alcohol-affected handwriting does the same. It is executed at the normal speed, but requires more complex maneuvers than driving, as one tries to turn one way, curve over, come back, reverse, retrace and so on, and the writer cannot carry out these movements as quickly as usual. The result is much more distance covered in the time it takes to make the same number of moves, so the drunken signature is much wider and less precise than the sober one.

Motor and visual-motor coordination become increasingly disordered with increasing intoxication. Mental concentration and balance become affected, so the writing can be expected to become even more disorganized. Visual acuity can remain the same, but visual disturbances occur because of slowed reaction time, with narrowing of the visual field, and difficulty with both eye convergence and accommodation, because the eye muscles are also reacting slowly (Hill and Toffolon, 1990). This, too, will make the writing slower and create difficulties in putting the pen exactly where required, keeping to the space provided, and so on.

Even low doses of alcohol impair the ability to perform complex constructive tasks (Dott, 1972), and performance deteriorates as task complexity and/or intoxication increases. This suggests that the automatized signature is not the best indicator of the degree of impairment, as it is so well habituated that it can be produced as a *Gestalt*, while textual writing must be worked out (i.e. constructed) by the writer as he goes along.

However, if the signature is significantly affected, it suggests the writer is very badly impaired and his textual writing would be even worse.

Copying is also not best evidence, as it has been found to improve with practice (Hilton, 1969). Hilton failed to note that copying is a less complex task than spontaneously produced writing, which must come from the writer's thought and be fully organized within his head and mentally monitored. Hilton (1969) and Rabin and Blair (1953) are among those whose studies were based upon copying, so their findings must be viewed with reservation.

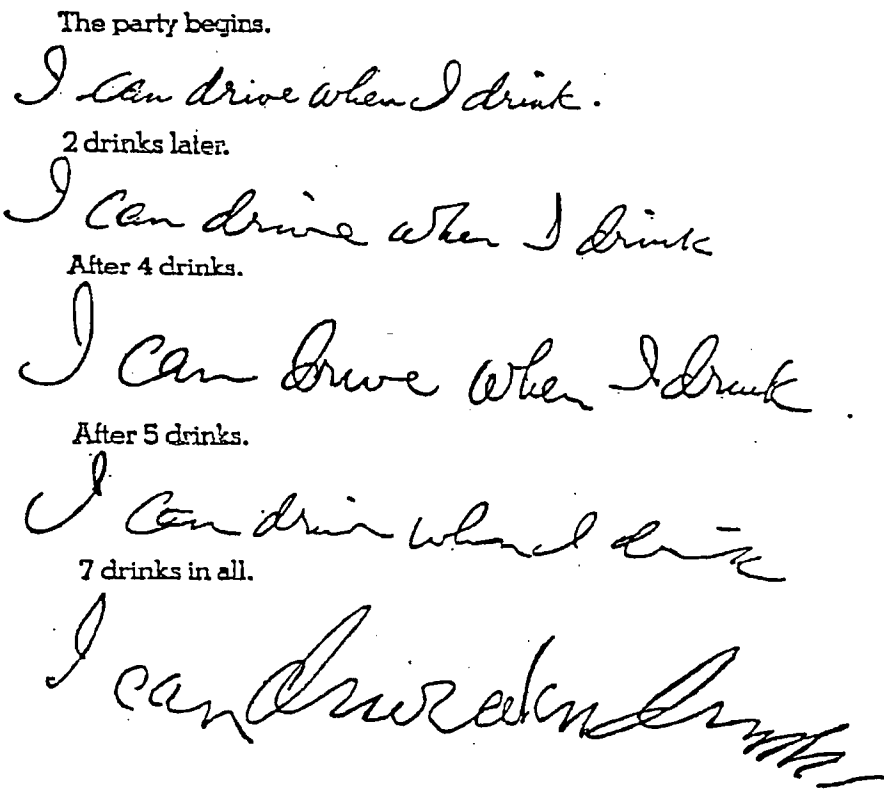
Abstract reasoning and decision making are

both difficult for the intoxicant, although verbal processing, even at high doses, is not impaired (Hartman, 1988). This means the intoxicated writer would be able to produce speech-related text, but would have trouble with all these other aspects of the task. Spontaneously produced, cursive textual writing uses the full complexity of brain functioning which is programmed for handwriting, so can be expected to more truly show a writer's degree of impairment, as compared with his signatures written at the same time.

As finger-tapping tasks, which test sequential-ordering ability, are not impaired (Dott, 1972; Hartman, 1988), the intoxicant would be able to plan and carry out a sequence of movement patterns, so he is not totally prevented from writing, as there is no "jamming" of the primary brain processes.

Non-alcoholics with high blood levels of alcohol do suffer ataxic disturbances, so unsteadiness of the hand would be added to the lack of motor coordination, but people intoxicated with alcohol do not show a reduction of grip strength, even at high levels (Hartman, 1988; Dott, 1972), which means muscular tension is maintained. This results in a writing ductus which is not likely to become very shaky or significantly weakened until the non-alcoholic has taken in so much alcohol that he would have obvious and severe difficulty in writing at all.

As well, at higher doses, eye-tracking, particularly of moving targets, becomes difficult (Dott, 1972; Hartman, 1988). This is part of the system which allows one to monitor one's writing, literally "keeping an eye" on the ongoing performance, so that one can properly follow a given or mental baseline. When this fails, the baseline "droops over" as the writing progresses.



Compared with the first sample of normal writing, one can trace the progression of intoxication. Even two drinks have noticeably slowed the reaction time, but have not significantly affected anything else in the writing. As he becomes more intoxicated, problems of eye-tracking cause the loss of ability to keep to a straight line. In the last sample, although obviously severely impaired, the writer can still produce the actual words and their related letter patterns, albeit in a degraded format.

Figure 1

(Reproduced with permission from The House of Seagram)

A smooth ductus, together with slowed reactions while maintaining forward speed, resulting in larger and wider writing without marked tremor, but with a possible drooping of the baseline from mid-page onwards, gives good probability that a writing sample is being affected by alcoholic intoxication. An example of this progression, together with some other samples of alcohol-affected writing, can be seen in Figures 1 and 2.

More studies which deal with alcohol-dependent subjects are sorely needed, but the

few which exist are of value to the forensic field. The most significant finding is that the alcohol-dependent person writes in a better organized, less tremulous fashion when he has had a few drinks, than he does when fully sober (Tripp et al, 1959; Hilton, 1969; Beck, 1985).

This phenomenon is well known in medical and other studies, which have determined that alcoholics, with blood-alcohol levels which would impair any normal person, improve their performance on almost all tasks (Hartman, 1988).

art. I was agast so far I have made
four phone calls with no satisfaction.
I feel that it was a rather cheap thing
on the part of Brouk U

After last night's saloon &
champagne I am stuffed
Hell if I know what to write

The first paragraph shows normal writing of a very fluent and well-practiced writer.

The second paragraph was written by the same writer after drinking five beers, but also having drunk champagne the night before.

Figure 2

Of interest here are the findings of aerospace science studies of the vestibular system of the inner ear, which is so crucial to air and space flight. It was found that the density of fluid in the circular canals of the inner ear is reduced by adaptation to chronic alcoholism, and this causes the alcoholic to lose balance and coordination when sober.

In such cases, the ingestion of an individually-specific level of alcohol brings the density up to normal levels and the related tremors and imbalances of the motor system are reduced (Money, 1975). This would explain the findings that a few drinks impair the writing of non-alcoholics, but markedly improve the writing of the alcohol-dependent (Hilton, 1969).

As well, the "finger tremor of alcoholism," postulated by Charcot more than a century ago, and observed by European medical graphologists ever since, has been differentiated by objective measurement from natural finger tremor of non-alcoholics. It was found to be of significant higher amplitude overall than normal physiologic tremor. Such studies as these can also be useful to examiners (Carrie, 1965).

Conclusion: This paper is merely a first step in addressing only one of the problems of disturbed handwriting which face the examiner. There are many more for which not even the first steps have been taken, and there is great need for the development of a body of research literature which will enable the document examiner to give an opinion with

full confidence that it can be supported to the standard laid down in the Frye v. United States decision.

The government-funded forensic document community has shown marked reluctance to seek information which can be related to handwriting from outside its own literature.

For those who are not constrained by institutional policies, one can only reiterate the need for investigation of any or all fields and disciplines which might provide relevant information. Such research in relation to other forensic matters has proved invaluable, and for handwriting identification it is very much overdue.

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Beryl Gilbertson, M.A., C.Crim., has been a multidisciplinary investigator of normal and abnormal handwriting since 1978. She holds both an M.A. in Special Education and Neuropsychology with extra courses and a Certificate of Criminology from the University of Toronto, and is a Ph.D. candidate there. She has been consulted by police in major crimes units and has lectured at University of Toronto Extension and Humber College Continuing Education on basic understanding of the handwriting process and its disorders. Ms. Gilbertson resides and works in Toronto, Canada.

**THE COMPARISON OF
PRINTSCRIPT TO CURSIVE
WRITING: IT CAN BE
ACCOMPLISHED BY THE
FORENSIC DOCUMENT EXPERT**

by
Phyllis Cook, B.S., BCDE,
Diplomate

As a modern forensic document examiner and expert in the analyzation and comparison of handwritten strokes, it is time for me to debunk the myth of the masters that claims, "Letters can only be compared to like letters." At the very least I can shed some light on the problem; at most, I can show you how to accomplish such a task.

First, I believe it is necessary to understand how and why this confusion arose. Second, we need to find out why the myth persists today. Third, and most important, we need to prove that this facet of document examination can be accomplished and, in doing so, dispel the myth.

What exactly is a myth? A few years ago, Bill Moyers devoted a television series to the exploration of myths because of the huge public interest in them. Those of you who are fans of the "Jeopardy" television program know that a popular category is mythology. Myths are: traditional stories of unknown origin, stories used to explain some phenomenon of nature (origin of man; religious rites), exploits of gods and heroes, fictitious accounts, unscientific accounts, theories or beliefs, any imaginary persons, or things spoken of as though existing.

People, probably from the dawn of mankind, have always wanted answers to questions: Why does the sun rise? Where does the wind come from? What causes a rainbow?

Because of their scientific ignorance, they made up answers and wove them into fantastic tales. (Remember the one about Pandora's box? That is a fantastic story all right, but it is fictitious.) As we know, there are scientific answers to these questions.

The field of forensic document examination harbors a very large myth that says, "Letters can only be compared to like letters." We can trace the myth to the old-time masters who proclaimed this to be so. This is not to say that we don't owe a great deal to those who, during their time, led the field in the forensics of handwriting, established sound methodology and wrote the texts; however, the state of the art has advanced tremendously since the days that Ames, Haring, Osborn, Harrison, Conway, and men of that caliber, were practicing and teaching forensic document examination. I think we are aware that what has been stated in the past no longer holds true today because the state of the art has advanced in leaps and bounds. We know so much more.

Edna W. Robertson, a respected authority in the field, writes: "The last fifty years of this century will have historical significance as the age of high technology.... As the paper industry has expanded, so have the manufacture and use of inks, writing instruments, typewriters, copy machines, computers and word processors, electronic communication devices, and microfilm, all of which serve to prepare, duplicate, or transmit a wide variety of documents." 1

First, let us take a look at Albert Sherman Osborn because his is the name that most attorneys are aware of today. He is the man whose reputation attorneys like to depend upon to discredit forensic document examiners during voir dire cross-examinations. Why? At one time he was the authority in the field.

Attorneys, prosecuting cases that aroused great public interest because of their high profiles, turned to Osborn for his expertise. In fact, Osborn and his son, Albert D. Osborn, were among eight of the prosecution's handwriting experts on the renowned Bruno Richard Hauptmann case. Hauptmann, you recall, was charged with the kidnaping of the Lindbergh baby. Hauptmann's case was termed "The Crime of the Century." He was successfully prosecuted during "the trial of the century" with the testimonial aid of Osborn who stated that Hauptmann wrote the anonymous ransom notes. But was Osborn right? Look at some of the discrepancies that eventually emerged:

- Hilda Zaeglein Braunlich, handwriting expert for the defense, was kept from testifying although she stated she could prove Hauptmann innocent in five minutes in front of the jury; they practically ran her out of town; she fled from Flemington, New Jersey, the site of the trial, to Florida.
- A reporter boasted that he rigged a piece of evidence against Hauptmann;
- The 14 ransom notes were tampered with before being introduced as evidence. The original notes that showed obvious overwriting in different colored inks when viewed under a microscope, were not shown to the jury; only photographic copies were used.
- Hauptmann was told how to misspell certain words when the police dictated the ransom notes to him to use as handwriting exemplars.
- During the trial Osborn called his profession a science "as exact as the science of astronomy."

Today document examiners have studied and examined the case in seminars, and many simply do not believe Hauptmann was guilty.

Now let us take a look at Osborn's text, *Questioned Documents*, the most popular text of the three he authored, and the one that opposing attorneys often bring to court. This work was originally published in 1929 when handwriting experts did not know about thin layer chromatography, electrostatic machines for the development of indented writing, infrared viewers, computers and scanners, Raman spectrometers, the latest equipment such as the VSC2000, etc., and so Osborn's work is certainly dated.

Still the text became a collector's item, and was later republished by Nelson Hall. No one can doubt what a tremendous work this is; however, it simply stops short of today's technology. Obviously, one cannot write about what one does not know.

James V. P. Conway's text, *Evidential Documents*, was first printed in 1959. The second and final printing was in 1972. The work does not include dissertations on guided hand signatures, assisted signatures, additions, or alcoholism in handwriting as far as I can see. Nonetheless, it is an excellent text as far as it goes. It merely does not go far enough to meet today's standards. I think that Conway comes close to agreeing with my theory that handprinting and cursive writing can be compared. I credit him for at least giving a nod in that direction in his chapter, Handprinting and Numerals: "Assuredly handprinting is susceptible to identification. But handprinting serves as an accurate index to its author in fundamentally the same manner as does its more utilitarian brother, cursive script. To be identifiable, a handprinting subject to inquiry must contain the individualities and characteristics of its author in adequate kind and number, and it must receive adequate evaluation in comparison with adequate exemplars of handprinting of the author. Frequently, a

single case or even a single document will include both cursive script and handprinting and thus, two discrete, if intimately related, avenues of identification are available.”² An intellectual nudge today might easily push him over to agreeing with this postulant.

One of the author’s personal preferences is Wilson R. Harrison’s book, *Forgery Detection*. This small gem was published in 1964. Sadly, it is now out of print. In Chapter 6, Harrison goes to great lengths explaining oblique lighting and grazing techniques. Why? That was the state of the art 35 years ago! That is what was available to the document examiner when he was performing his work. There are still occasions when a document examiner may use grazing techniques, but we have come a long way since then, and no longer need to depend upon this method only.

Parts of these texts, one must admit, are obsolete. Most professional document examiners are familiar with Ordway Hilton’s text, *Scientific Examination of Questioned Documents* (Please note: Mr. Hilton passed away in April of 1998.). But we also know that Mr. Hilton was wrong when he testified that the forged Hitler diaries were genuine. The account of the Hitler Diaries, published in *Cook’s Compendium on Document Examination*, reveals that the so-called Hitler diaries had a spurious background. Historians, too, cited that Hitler did not like to write even to the point of dictating *Mein Kampf*, and had a deteriorating physical condition that made his hand shake, and that historical events were chronologically inaccurate as described in the diaries. “Several historians, autograph dealers and handwriting experts were given the opportunity to examine all or part of the diaries.... Most claimed they were not authentic, a few straddled the fence, and a couple claimed they were genuine. Two reversed their opinions.”³

We understand that even the most well-known and respected experts, those who are leaders in their fields, can be incorrect in their opinions. Obviously, we do not like this to happen, but ours is not an exact science regardless of Osborn’s claims to the contrary.

So now we know that the major textbook writers do not believe that printscript can be compared to cursive. But I respectfully propose to differ with them. As forensic document examiners, I think we should have these texts in our professional libraries even though we cannot agree with everything that the authors have written; we have to admit that their works are somewhat outdated. But we also have to admit that they contain a wealth of information that can still help us shed light on sticky problems. We can use them in our research. We shouldn’t throw the baby out with the bath water. We want to keep the parts of these works that are relevant to today’s modus operandi.

The Federal Bureau of Investigation, at least in the 1980’s, claimed that the questioned and known specimens must be “comparable.” This is what they have stated: “A’s cannot be compared with G’s- ‘John Jones’ cannot be compared with ‘Samuel Hansen’- The J’s must be compared with J’s and the ohn’s with ohn’s. Handwriting cannot be compared with hand printing.”⁴

I strongly disagree. I have the right to disagree with the premise that letters can only be compared to like letters because, like you, I studiously perform such tasks every day as an expert in the field of forensic document examinations. As experts we know that judges and attorneys rely on us to analyze and compare handwritings, and then testify in courts of record to our findings. We have examined questioned documents of all kinds: anonymous notes, death threats, suicide

notes, hospital records, graffiti spray-painted on walls, mirrors and in trucks, letters etched on elevator doors and window glass, etc. We are not experts in analyzing tire treads, gunshot wounds, blood samples, fingerprints or urine specimens. We know our limitations. We are experts in script. Script is made up of strokes. Therefore, we can analyze and compare strokes and letters whether or not they appear in “like letters.”

We can analyze and compare their slant and/or change of slant, relative size and/or change of size, relative height of capital letters to lower case letters, zonal proportions, horizontal spacing or neglect, vertical spacing or neglect, margins, indentations of paragraphs, alignment of lines and words, alignment of signatures on ruled lines, directional trends, pressure or lack thereof, line quality, degree of writing skill, relative speed, simplification, elaboration, sharpness, pastosity, flexibility, fluency, starting and ending strokes, pen thrusts, flying starts and finishes, originality, unnatural repetition, excessive underscoring, letter combinations, visual patterns and shading. That’s for starters.

We can analyze and compare unique strokes, unique stroke combinations and idiosyncrasies in one’s handwriting. We can analyze doodles and scribbles. We can analyze and compare concealed strokes. We can analyze and compare strokes written without the use of hands, but with a pen held in one’s teeth or a crayon held between one’s feet. We can even analyze and compare *airstrokes*. Airstrokes have been accurately defined as “invisible evidence” by the late forensic document examiner, Karl Aschaffenburg.

We can do all of this because we are trained forensic document experts. On August 2, 1998, Show Time TV broadcast “Lolita” with Jeremy Irons. When, during the course of the

movie, Lolita left him for another man, he searched for her and claimed he was able to recognize her new lover’s handwriting on hotel registers, even though the writer used different names when signing the various registers. The author, obviously a lay person to our profession, felt it could be done or he would not have written those words; I think we can be reasonably certain that an expert should be able to perform the same task.

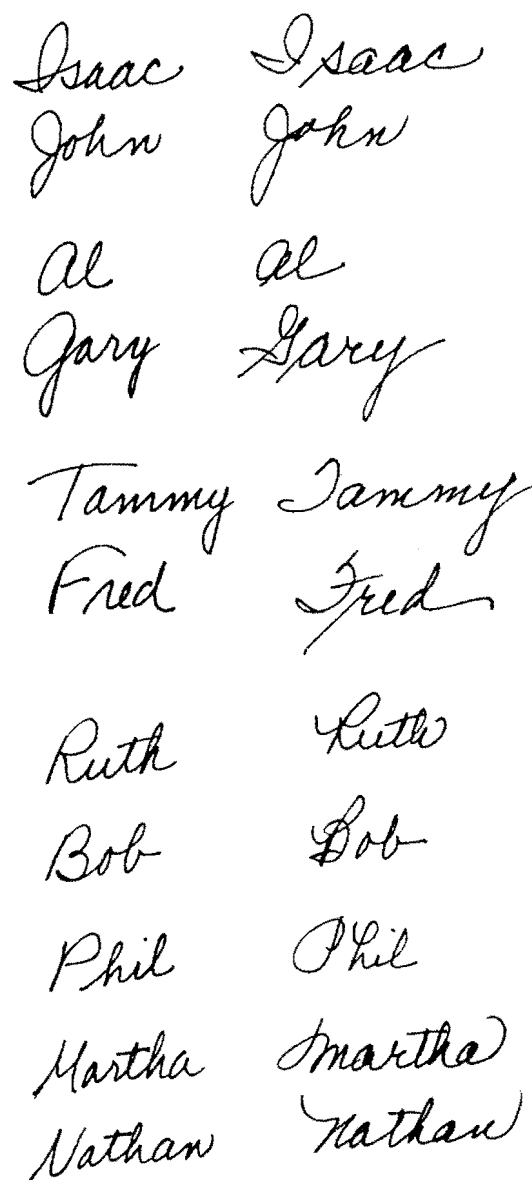


Illustration 1

Illustration #1 shows G's compared to A's, M's compared to N's, R's compared to B's and P's. We even compare F's and T's. It should be easy for an experienced examiner to identify the two writers of Illustration #1. For the more inexperienced examiner, one writer wrote Column A, and another writer penned Column B. Each writer wrote naturally with no attempt to disguise. Whenever one writes, s/he leaves unconscious tracks throughout the writing line. Compare the capitals I and J of each. Look at the similarity in the structure of those letters as they pertain to the upper and middle zones. Compare the capitals A and G, the capitals R, B and P. Look for the giveaway signals that unintentionally arise in the stroke structures. You should begin to see visual patterns. Column A has "Ruth," "Bob," and "Phil," beginning with direct downstrokes, whereas Column B has those names beginning with lead-in strokes. Column A shows printscript capital letters in "Tammy" and "Fred," whereas Column B indicates cursive writing in those letters. What about the capitals M and N in Column B? Did they throw you? They shouldn't have if you examined and compared the slant, height and retracings found in those letters. The writer of Column A begins at the baseline and ascends, whereas Column B has lead-in strokes that start in the upper zone and descend. Look at the entire names. One can certainly compare the "artha" of Martha with the "athan" of Nathan. Specifically, look at the lower case h's. Column A has spacing between the loop and hump sections, whereas Column B does not. Now check the base line connections, the slant, the pastosity of the lower case a and h formations, the height of the th formations when compared to the capital letters, the placement of the t-bars, the underslung lower case a's and the termini (ending boundaries) that rise into the upper zones. Now that you see those similarities, compare the same factors to the writer of the

Column A. Use every bit of writing evidence at your disposal. For those of you who are students in the field, look at the exciting facets you are about to learn!

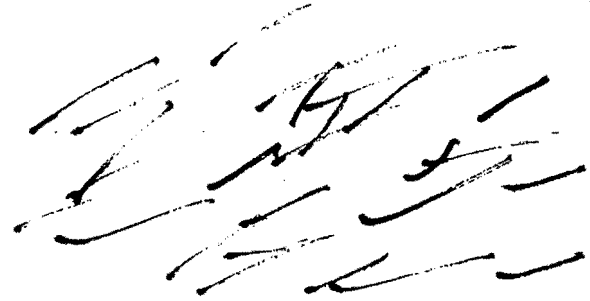


Illustration 2

#2 Although we have no letters to analyze, we should notice how the writer jabbed and stabbed at the paper, lifting the pen to jam it down again and again.

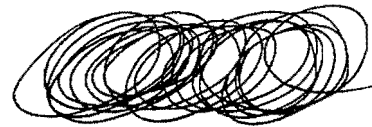


Illustration #3

Can you see how the writer of Illustration #3 was running around in circles? Unlike the writer of the Illustration #2, this writer held onto the writing instrument, going around and around for long intervals, without lifting the pen.

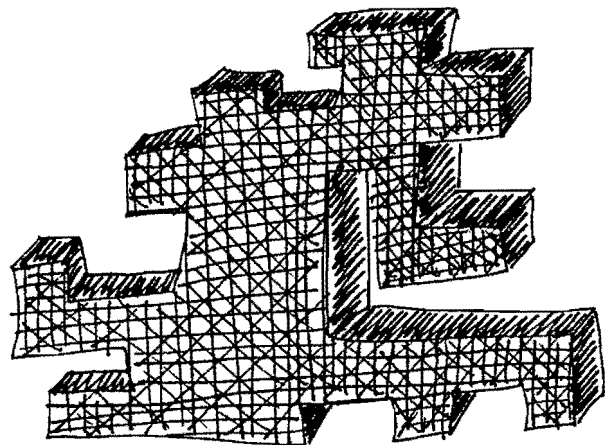
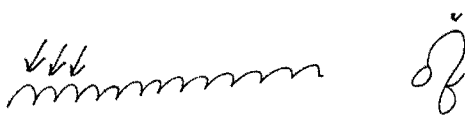


Illustration #4

Are you able to see how the author of Illustration #4 was conscientiously concentrating on creating many strokes while writing within a tight framework? The parameters of the writing were dictated by the size of the paper. Strict restraints are placed upon the writer by the confines of the space. The strokes appear to be quite precise for a doodle.

Now examine Illustration #5a-d. You can readily see that they represent four styles of writing: garland, arcade, angle, thread.


 MINIMUM = *minimum*
 garland - a


 minimum = *minimum*
 arcade - b


 MINIMUM = *minimum*
 angle - c


 MINIMUM = *minimum*
 thread - d
 Illustration #5 a-d

The natural form for a garland writer consists of well-rounded base line connections, usually with a rhythmic flow, resembling a garland. For example, a lower case n will resemble a copybook lower case u. Note the word "minimum" in the illustration.

An arcade writer is just the opposite of a garland writer. The natural form for an arcade writer consists of upside down garlands, like umbrellas or arches. Note the word "of" in the illustration.

The natural form for an angle writer consists of angles and rigidity at the tops and bottoms of most turning points. See how the angle writer pens the word "minimum." Compare it to the garland writer's example.

Finally, we come to the thread writer. Here is one who writes with a scrawling hand, like a piece of cotton thread that has been dropped onto a surface, sometimes making a loop, sometimes not. Many letters are indistinct. This is what the lay person refers to as a "doctor's writing." Keep in mind there are countless variations of the four styles of handwriting.

All this knowledge has been culled from mere strokes. Except for "minimum" and "of" words were not written in these illustrations, let alone "like letters." Just strokes. But the expert in strokes makes sense of it all. The expert doesn't say, "I'm sorry but this can't be analyzed because there are no like letters showing, and individual letters can only be compared to like letters." This is what we must explain to the attorneys who are examining us in court. It is imperative to get the point of stroke comparison across to the jurors.

Next we advance to printscript. *Print* refers to impressions made by machines that make

fancy impressions on butter pats, for example, or by printing presses that deal in the printed word found in newspapers, books and magazines. *Printscript* refers to handprinted lettering. As a colleague of mine aptly put it, "Strokes are what we analyze, and they come in a lot of different forms. Printscript vs.

cursive is just one more such experience and we should not be afraid at least to look at it."

Illustration #6 comes from an actual case. My client, a business manager, claimed he found the author of an anonymous note that was written in cursive script by investigating some

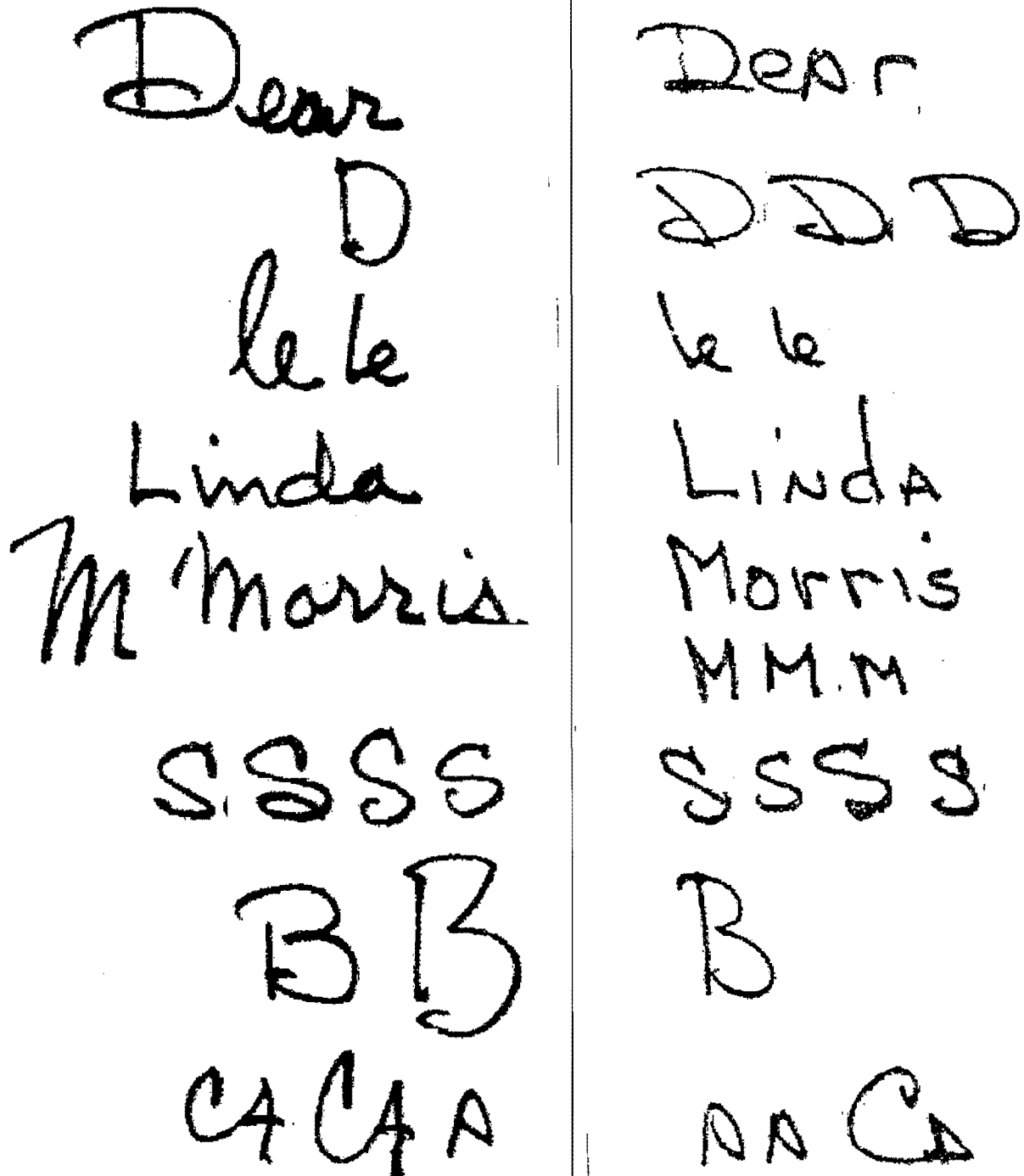


Illustration #6

printscript and comparing it. When he sent me the following evidence, I conditionally agreed with him. (I told him I would like to examine the handwriting in its entirety because he selected the evidence, what we call fragmentation, and examiners prefer not to examine writings in bits and pieces.)

Certainly, if a lay person can make these determinations, a forensic document examiner should be able to. And we can. Because our "forensic forefathers" were ignorant of the knowledge that has been made available to us, and followed some incorrect premises in their texts and practices, there is no reason for us to blindly follow. A wise person once said, "If you don't have a good reason for doing something, then you have a good reason for not doing it."

We have progressed during the decades. We have studied hard, learned our lessons, and improved our techniques. We have researched and kept up with the latest scientific advances. We have postulated and tested theories. We have purchased and used the latest equipment made available through the state of the art in our laboratories. We need not hamper ourselves by being constrained to outmoded attitudes and pronouncements. Indeed we should not be intimidated. (If we did not stay abreast of the times, we would still be moving earth with teaspoons instead of steam shovels, and cutting people open to remove kidney stones instead of crushing the stones with lasers.) We know that strokes can be compared to strokes, and that different letter formations can be compared. Logically, we take it one step further and compare cursive writing to printscript.

The following samples will show you that in some people there is a definite carryover of

the strokes they use in cursive writing to the strokes they use in printscript, and with some there is not. The following exercises are for your comparison. A little guide list of handwriting facets is provided for your use. Because you do not have originals, I have omitted pressure, pressure patterns and depth of pressure. Feel free to come up with additional points of comparison.

GUIDE LIST

CONNECTIONS	PAGE LAYOUT
TERMINALS	TICKS
EMBELLISHMENT	FORM
PATCHING	PROPORTIONS
FLOURISHES	UNIQUENESS
TREMORS	SPACE
RETRACING	SLANT
INK BLOBS	MARGIN
INITIAL STROKES	
SKILL UTILIZATION	
STYLIZATION	

MESSAGE:

→ Hi - ☐ Let me know if it's not too late to add my printing/writing to your samples. ☐ Also, I can send you a group of 50 others, that were sent to some of us from Lois Hatfield - you may have them already.

→ If you have them already, you can use this as my sample. ☐ As you can see, printing is not natural for me. ☐ After learning the Palmer method, in 4th grade I was made to print. It really threw my writing off for a

Exercise #1

Besides the indicated pattern of spacing, paragraph indentation, left margin and figure 8 lower case g's, did you notice the capital I formations made in one stroke? What else did you discover?

① My important goals for the next six months would be to work in a position that enables myself to create an enjoyable work environment. ② An environment which fosters teamwork, creativity and contributions to the bottom line. I would like to create the right strategy, develop the right systems, design the right support systems and hire the right people.

③ There are many qualities I possess that would enable me to accomplish these goals. I have a personality which people look up to and trust. Due to my high energy level my staff members have been easily motivated. My ability to solicit feedback without fear of retribution affords the staff to take ownership of their positions with loyalty to the corporation.

③ An ideal work environment would be to work with a cohesive staff. ④ Staff who appreciate each other. I would like my superiors to have a keen understanding of my position and help foster growth in myself.

Exercise #2

This exercise was included to demonstrate unique letter formations in the capital A's and lower loop formations. Uniqueness, a writing feature individual to one writer, is a very positive indication of similarity between writings. I rely quite heavily upon unique writing formations, those strokes that are peculiar to one person's writing. I agree with

Karl Aschaffenburg who said, "To the handwriting expert, the process itself by which writing is produced is of utmost importance. The uniqueness of the letter forms - in fact, of the whole covered page - signifies the uniqueness of the writing process in each individual."5

My most important goal for the next six months a
always; is to be successful and happy in whatever
choose to undertake. For I feel that if I am not
successful then I have worked to my full potential,
if I am not happy, I will not succeed. In the ne
six months I would like to be getting established;
a career, not just a job. I hope to be gaining exper
in, and mastering each and every aspect and function
of my position and others', thereby enabling me to
eventually make the transition to a management

I feel that I have several qualities that will en
me to meet my goals. I enjoy working a great deal
and I am very dedicated and ~~very driven~~ very driven
I have excellent communication skills which enable
me to easily establish and maintain a good rapport
with individuals on all levels. I am also very flexible
and adapt quickly to new products, procedures, and
ideas. I enjoy handling many different tasks and
love working with people.

My ideal working environment allows me to exercise
and make use of my communication skills. It allows
to learn many different tasks so I have a good overview
of the entire process and it also allows me to get
and meet the people I am servicing.

Exercise #3

Besides the indicated patterns, did you
discover the pen lifts in the two capital M's
that begin paragraphs one and three? (Pen

lifts, like hesitation blobs, are red flags to the
forensic document examiner, and their
importance cannot be overestimated.)

"Mary Had a Little Lamb"
— MARY HAD A LITTLE LAMB —

Exercise #4

Did you measure the downstrokes on the lower case y's? Did you notice the base line pattern in the capital L's? Did you note the unusual lower- case a formations (replicated in the bulb portion of the lower-case d)? Did you catch the suspension of the second part of

the lower-case h's? Did you pick up the terminal strokes that resulted in rounded, ink dots? Even though this sample is small, there is overwhelming evidence to provide the document examiner a positive identification...if this were an actual case.

Mary had a little lamb.

It's fleece was as white as snow.

Everywhere - Mary goes.

The lamb goes to.

MARY. has a little lamb.

It's Fleece was white. snow.

Every wher MARY. goes.

The little lamb goes to.

Exercise #5

Some of the similarities are letter formations (capital M's, E's and T's), poor writing skill yet excellent organization (see vertical

spacing and margins), spelling errors ("Everywher" and "to"), and periods/dots galore.

Mary had a little lamb whose fleece was white as snow,
And everywhere that Mary went the lamb was sure to go.

Mary had a little lamb whose fleece was white as snow,
And everywhere that Mary went the lamb was sure to go.

Exercise #6

This specimen is fairly easy to determine because similarities abound. Precision and a desire for perfection walk carefully hand in hand, slowly and neatly. Spacing, slant, and like letter formations are in evidence. We

need to keep in mind that "like letter formations" is not the same as "like letters." My theory espouses the former; the FBI insists on the latter.

Mary Had A Little Lamb

Mary had a little lamb whose fleece was white as snow
And everywhere that Mary went the lamb was sure to go.
He followed her to school one day which was against the rule
It made the children laugh and play to see a lamb at school

MARY HAD A LITTLE LAMB WHOSE FLEECE WAS WHITE AS SNOW
AND EVERYWHERE THAT MARY WENT THE LAMB WAS SURE TO GO
HE FOLLOWED HER TO SCHOOL ONE DAY WHICH WAS AGAINST THE RULE
IT MADE THE CHILDREN LAUGH AND PLAY TO SEE A LAMB AT SCHOOL

Exercise #7

This specimen is not so easy to determine as the previous one although it, too, indicates a desire for perfection within the writing lines. Of all the handwriting specimens I requested, this writer was the only individual to write the entire four lines of the ditty. She was the only writer to title her work. It is more quickly written than the preceding sample (particularly for a vertical writing). We know this because

of drag strokes throughout the sample. It is also more mature than the naive, uncluttered writing of Exercise #6. [The original document shows an uneven pressure pattern in both the cursive and the printscript. Not only was the writer under duress because of illness in her family, but also she was writing on her lap.]

Mary had a little lamb
Its fleece was white as snow
and everywhere that Mary went,
The lamb was sure to go.

MARY HAD A LITTLE LAMB
ITS FLEECE WAS WHITE AS SNOW
AND EVERYWHERE THAT MARY WENT
THE LAMB WAS SURE TO GO

Exercise #8

Here we have ascending lines of writing. The lower case y's are unique in that the writer, probably for expediency, sloughs off the upper right section in the middle zone.

Similarities are indicated in the Roman numeral capital I's and the lower case w's and l's. Notice the T/h combination in "The."

" Mary Had a Little Lamb "

Exercise #9

" MARY HAD A LITTLE LAMB "

This is very easy for the forensic document examiner to determine because of numerous similarities: the use of quotation marks, the

spacing between the beginning quotation marks and the capital M's, the large spacing between words, the height of the lower case t's

and t-bars, four L's made the same way regardless of upper or middle case, the unpretentiousness of the writing, the ascending lines. All of these handwriting characteristics contribute to the identification of one writer. Of course, these samples have been selected for educational purposes.

Forensic document examiners, hear this: Do not let yourselves be brainwashed or intimidated by the ineptitude of others. If someone says it cannot be done, and you know differently, speak up. A great threat to the field of forensic document examination is a fear of treading on "sacrosanct" theories that have become passe. We do not diminish others by acknowledging that some of their methodology is woefully outdated; in fact, I think we pay tribute to them by building on the foundation they have laid.

Persistent characteristics are bound to emerge in one's writing whether it be in printscript or cursive writing or an attempt to disguise one's handwriting. One's individuality, one's uniqueness, emerges in one's handwriting. This is what makes our work doable. If you incorporate my theory into your daily practice, you will become a more astute and comprehensive analyst.

Endnotes:

1 Edna W. Robertson, *Fundamentals of Document Examination*, Chicago: Nelson Hall, 1991, 10.

2 James V.P. Conway, *Evidential Documents*, Springfield, IL: Thomas, 1959, 59.

3 Phyllis Cook, *Cook's Compendium on Document Examination*, Glenside, PA: Philascript Co., Inc., 1986, 61.

4 *Obtaining Known Writing*, Federal Bureau

of Investigation, US Department of Justice, reprinted from the FBI Law Enforcement Bulletin, September 1970, revised December 1980.

5 Karl Aschaffenburg, *Collected Essays on Various Aspects of Handwriting Examination*, M.E. Aschaffenburg ed., Princeton, NJ, 1986.

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J. Vreeland Haring, *The Hand of Hauptmann*, Plainfield, NJ: Hamer Publishing Co, 1937.

Wilson R. Harrison, *Forgery Detection*, New York, NY: Frederick A. Praeger, 1963.

Ordway Hilton, *The Scientific Examination of Questioned Documents* Rev. Ed., New York: Elsevier, 1982.

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The Crime of the Century: Was Hauptmann a Victim? The Evening Bulletin, Philadelphia, PA, 1977.

The Crime of the Century and Still a Mystery, The Philadelphia Inquirer 306 60, Philadelphia, PA, 1982.

Phyllis Cook is a court qualified, board certified forensic document examiner. As a teacher in the Philadelphia elementary schools, she became interested in handwriting while teaching children to write. In 1972, she left the teaching profession to start The Philascript Co., Inc., and in 1979 she co-founded NADE. She has lectured throughout the country, taught the subject on television, apprenticed students on the forensics of document examination, and authored numerous articles and several books. Although her sense of humor is known to most, she is deadly serious about her profession and the ethics of those who are experts in the field.

COURTROOM TECHNOLOGY OF THE FUTURE

by

Jeanette Hunt, CDE, BCFE

As many of you may know, technology in many courtrooms has taken a giant leap forward. The courtroom of the future may contain a digital evidence presentation system that will simultaneously present visual evidence to the judge, jury and attorneys.

Some courtrooms already have a Pentium 133 computer at the judge's bench, one for each counsel table and one for each two jurors in the jury box. They are used in conjunction with the "real time" court reporter system; three to five seconds after something is said in the courtroom, the statement appears on the monitors at the counsel table and on the judge's bench. The attorneys are able to take notes while viewing testimony. There is a split screen that allows the simultaneous viewing of current and previous testimony; there is also time stamping on each line of testimony for finding time-specific segments of reference. Attorneys will be able to purchase electronic daily copy with these added features at regular transcription rates. Hard copies and disks are available.

It will be possible to access the rules of evidence, the rules of criminal and civil procedure, the rules of appellate procedure, pattern jury charges, and sentencing guidelines through the courtroom computers. These computers will be connected to Westlaw and the Internet as well as the federal court's internal wide-area network. This will allow the judge to communicate with his or her staff or any other judge from the courtroom.

There is a Doar Digital Evidence Presenter

System which will allow evidence to be projected directly to TV monitors. This includes photos, documents, books, 3-D objects, x-rays (positive or negative), fingerprints, DNA, autorads and transparencies. There are enlargement and reduction capabilities. The Trial Illustrator will allow a person to draw on or highlight evidence images on the courtroom monitors without touching the real evidence. A presenter can highlight, circle, underline and annotate the image on TV, similar to what is done on Monday night football. The DEPS(tm) unit can also be utilized in taking depositions. The judge has total control over courtroom display prior to the jury seeing the documents or evidence. A simple press of a button will turn off the jury's monitor until the ruling has been made. The unit can be used with a Computer, a Visual Image printer, a VCR, Video Conferencing and is portable.

Up to 250 images can be stored on a digital disk without using a computer and can be randomly accessed instantly with a remote control or bar code reader. All exhibits may be stored on a CD ROM disk for presentation to the jury. The Image Printer will allow one to create instant color photos in 60 seconds from any source.

In addition, there is a Doar ExhibitMaker that will convert documents, maps and photographs to enlargements of 2'x3' or 3'x4' quickly and easily, without splicing or pasting. You could produce your own professional exhibits, as the unit is sold to the public. You could magnify your evidence effortlessly for improved jury comprehension of critical facts. There are two frames in the sizes mentioned above that utilize Velcro and will accommodate the output from the ExhibitMaker. The system accommodates a computer interface for Macs or PCs, to allow printing of computer generated graphics.

Video conferencing can be installed in the courtroom so that a witness who is unable to be present in court will be permitted to give his or her testimony through live television from any properly equipped location in the world.

The clerk's office can distribute orders by imaging all orders and sending them by fax rather than by mail for attorneys who have registered.

The PACER system will allow attorneys and court personnel to gain access to docket sheets for pending cases, including all documents filed in the case. The attorneys will be able to electronically access filed motions, responses and opinions.

Federal judges and attorneys will be able to get "hands-on" training in a lab on use of this computer system in their chambers, and for legal research, word processing, electronic mail and calendaring.

This visual technology will enable jurors to evaluate complex issues intelligently and increase jury comprehension and retention. It will enable the document examiner to communicate factual information more effectively to the judge, jury and attorneys simultaneously.

Jeanette Hunt, CDE, has been a member of NADE since 1994 and has been a frequent and welcome presenter at NADE seminars. In addition to managing her successful document examination business in San Antonio, TX, Jeanette is a Certified Instructor for Texas Police Officers through the Texas Commission on Law Enforcement Standards and Education and also has completed specialized training in Statement Analysis (Psycholinguistics).

INK DIFFERENTIATION USING A DIGITAL CAMERA

by
Emily J. Will, M.A., CDE

Document examiners are often presented with the question, "Was the writing executed with more than one writing instrument?" This often means, "Is all the ink the same?" The question usually is asked because to the naked eye, the ink does appear to be uniform. It may appear to be black or close shades of blue.

One traditional approach to answering this question has been through infrared photography with a 35mm camera. A special infrared (IR) sensitive film is used under carefully controlled conditions. It is not possible to see in advance what the results might be, but after the film is processed, if different inks were present on the document and if they reacted differently to IR excitation, then these different reactions might be recorded on the film. With the arrival of digital cameras there is an easier way to approach this problem.

Differentiation of inks can be achieved using filters and a digital camera. This article explains the process and gives examples. Please note that this article refers to the Sony Digital Mavica series of cameras because this is the camera that the author has found to be most suitable. There may be other digital cameras that would do as well, or even better.

Inks which look the same upon visual examination, may be revealed as different by their different reactions to IR radiation. (1) The IR is a band of the electromagnetic spectrum just above visible light (see Figure 1). IR rays have longer wavelengths than visible rays. Wavelengths in the electromagnetic spectrum are measured in *nanometers* (millionths of a millimeter) or *angstroms* (ten-

millionths of a millimeter). Humans are more likely to feel infra-red as heat than to see it as light. (2)

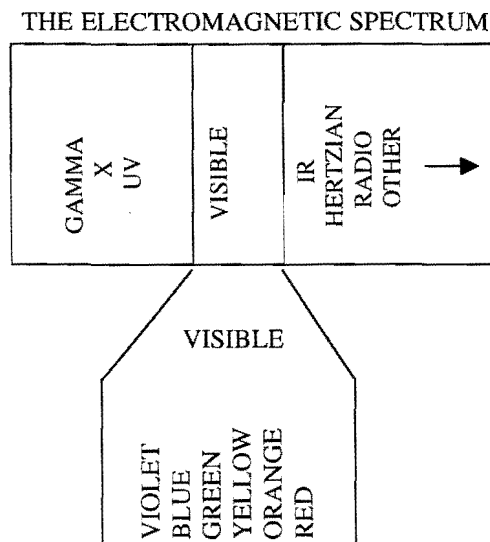


Figure 1

The band of light that humans can see is just a small part of the electromagnetic spectrum.

An electronic viewing device can make IR waves visible to the human eye. With such a device, two inks that appear to be the same to the unaided eye can be seen to be different if they react differently to excitation by IR radiation. (3)

The Sony Digital Mavica FD-7 camera is such a device. When light with IR content (a typical high-intensity lamp or inexpensive floodlight will do) is focused on a questioned document, the light (including the infrared content) will be either absorbed or reflected to varying degrees. As more light is absorbed, less is reflected, and vice-versa.

A Kodak Wratten IR filter allows only IR and longer wavelengths to pass through. The Sony digital camera is sensitive to IR. It allows the examiner to see the reflected IR and to photograph it. Kodak Wratten filters were at one time available at five different ratings.

Today only three of these filters are still manufactured by Kodak (see Figure 2). Other companies, such as Tiffen, also have made IR filters.

Kodak Filter #	Nm
89B (current)	690
88A (disc.)	720
87 (current)	740
87C (current)	790
87B (disc.)	820

Figure 2

Each filter allows waves at only its rating or longer to pass through. Let us consider a situation in which two black inks are present. Ink A reflects IR wavelengths, while Ink B absorbs most IR. Viewing the document with the Sony camera and using the Wratten 89B filter rated at 690 nm, we see Ink B only faintly, because Ink B reflects very little IR which can pass through the filter to the camera. This is shown in Figures 3a and 3b.

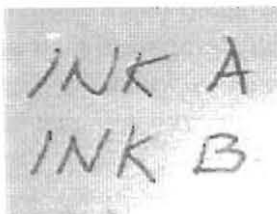


Fig. 3a



Fig. 3b

On the left are Inks A and B photographed without filtering. On the right, the 690nm filter is in front of the camera lens. Ink B is less visible than Ink A because it does not reflect as much IR as does Ink A.

This technique has been used by the author in the examination of questioned documents. In one case, the writer of a journal asserted that the writing in each of two questioned entries

was executed in one writing session. The question asked was, "Are there any indications that more than one pen was used to prepare each questioned entry?" To the eye, even under magnification, the inks looked identically black, and no clear differences could be discerned.

Each of the questioned entries was examined and photographed using the Sony digital camera with and without the Wratten filters in front of the camera. One of the questioned entries did not show clear differences in reaction to infrared. It is possible that with different filters or different techniques, some different reactions could have been documented. It is important to note that failure to observe differences using this technique does not in itself constitute proof that there are no differences.

One of the questioned entries did show documentable differences. In this instance inks that appeared to be the same even when viewed through the Wratten 89B (690nm) filter, were then differentiated when viewed through the Wratten 87 (740nm). With the Wratten 87 filter, one section of writing "disappeared". Figures 4a and 4b show the unfiltered and filtered views of portions of the questioned entry.

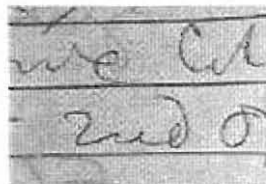


Fig. 4a

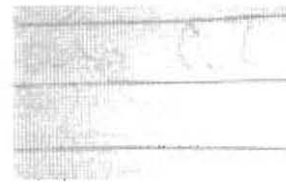


Fig. 4b

On the left is the unfiltered view. On the right is the view using the Wratten 87 filter. One ink has not reflected IR wavelengths long enough to pass through the filter.

The fact that one ink can be seen through the Wratten 89B, but not through the 87, tells us that it reflects IR wavelengths, equal to or longer than 690 nm, but absorbs those wavelengths that are 740 nm and longer. If those longer wavelengths had been reflected instead of absorbed we would have been able to see them, even with the 87 filter. The other ink can be seen through both filters and therefore reflects wavelengths 740 nm in length or longer. It should be noted that the author did not have a 720 nm (Wratten 88A) filter at the time of this examination.

IR absorption and reflection are not the only properties that can be studied. Inks can also be luminescent. There are two types of luminescence: fluorescence and phosphorescence. Ink is more likely to exhibit fluorescence. Some inks, when excited with a specific wavelength of light, will cause a shift to a different reflected wavelength. This shifted reflection is fluorescence. Some materials continue to reflect even after the exciting source is removed. That type of luminescence is known as phosphorescence.(4) The setup for this work is complex, requiring a range of excitation lighting as well as a range of camera filtering. The digital still camera may prove to be a useful tool in such a setup.

The digital camera is a new and valuable tool for the document examiner. With the right camera, a good light source, and an assortment of IR filters, the document examiner can often discriminate between inks that appear to be identical.

References:

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THE JUDICIAL PERSPECTIVE OF EXPERT WITNESSES

by

The Honorable Michael G. Bagneris
Civil District Court Division H
New Orleans, Louisiana

Document experts have been around since time immemorial. Early development of handwriting expertise systems can be traced back to Italy and France in the early 17th Century.¹ In France by 1737 the laws were incorporated into the Code du Faux (Code concerning Forgeries), which contained detailed provisions for regulating the collection of exemplars and their presentation to handwriting identification experts.² During the English common law period though, experts of any kind did not play a large role in litigation.³ Although handwriting identification expertise is the oldest "forensic science," it did not secure a place in the English common law courtroom until nearly a century after its introduction into French proceedings.⁴ In early American jurisprudence, where there was similarly a slow development of this field, testimony of expert witnesses was usually rejected.⁵ The inclusion of any such testimony was typically regarded with great suspicion.⁶ Today, these views have shifted and expert testimony is now commonplace and highly regarded as a key component of the trial system.

It is undisputed that expert testimony is a significant factor in modern litigation.⁷ As one judge noted, "Expert witnesses supply the mortar that is used to build the house."⁸ They can play as great a role in the organization, shaping, and evaluation of their client's case as do the lawyers.⁹ Having the potential for such impact has inevitably created opportunity and expert testimony is big business. In response, the courts have not remained idle in the face of what appears to be an expert explosion.¹⁰ Precedent reveals that the courts have long been aware of the expert's unique contribution to a trial and have acted to maximize the continued benefits of their involvement.

General Overview

When the facts of a case require scientific, technical, or other specialized knowledge for proper evaluation, the source of that information is the expert witness.¹¹ If such specialized knowledge will assist the trier of fact to understand the evidence or to document the fact in issue, a witness qualified as an expert by knowledge, skill, experience, training or education may testify thereto in the form of an opinion or otherwise.¹² The purpose of the experts is to aid the trier of fact in the determination of complex issues. However, at least in theory, practically anyone may be qualified as an "expert."¹³

¹Michael Risinger, *Science and Nonscience in the Courts: Daubert Meets Handwriting Identification Expertise*, 82 Iowa L.Rev. 21, 22 (1996).

²*Id.*

³*Id.* at 23.

⁴*Id.*

⁵*Id.* at 24.

⁶Risinger, *supra* note 1, at 25.

⁷Douglas R. Richmond, *Regulating Expert Testimony*, 62 Mo. L.Rev. 485, 486 (1997).

⁸Telephone interview with Judge Robert Langlois,

Massachusetts State Court Judge, in Dedham, Mass. (Sept. 23, 1998). (Hereinafter "Judge Langlois Interview.")

⁹Richmond, *supra* note 7, at 486.

¹⁰*Id.* at 490.

¹¹Christopher M. McDowell, *Authorizing the Expert Witness to Assassinate Character for Profit*, 28 U.S. Mem. L.Rev. 239, 243 (1997).

¹²Fed. R. Evid. 702

¹³McDowell, *supra* note 11, at 243.

Therefore, judges are very careful when determining what weight, if any, to place on expert testimony, and in how they instruct a jury regarding their reliance on expert testimony.¹⁴

A judge may be shown two signatures, one real and one forged, and in certain cases he can tell you that they are different, but in most cases he cannot articulate how and why these signatures are different. It takes a document expert to enter the courtroom and logically explain how signature "A" varies from signature "A-1." Such specialists bring their skills, training and opinions to an otherwise uninformed courtroom.

While all expert witnesses enter the courtroom under the court's assumption that they are appropriately and adequately qualified, actual qualifications can vary greatly. For example, expert witnesses can range from highly trained document experts to questionable "specialists."

In the wake of such shows as "LA Law," "The Practice," "Ally McBeal" and "Law and Order," "handwriting identification" is almost a household term.¹⁵ However, the profession of questioned document examination, also includes examination of typewriting, printed materials, and any graphic presentations for the purpose of identifying the writer.¹⁶ An important part of the examiner's task may involve the authentication, dating, and sequencing of undated documents to determine which documents

were made earlier and whether substitutions of pages have been made.¹⁷ He also deals with the decipherment of erased, obliterated, charred and water damaged documents; and, the restoration of faded or chemically erased text.¹⁸ Document experts engage in sophisticated analysis that may require extensive laboratory equipment.¹⁹

On the other hand, there are some document experts who profess competency in the examination field entirely on the basis of their own self-study, or no studies at all, without having obtained supervised training or having studied the available literature.²⁰ Certain boards will even provide "Certification," requiring nothing more than sending in a check.²¹ Due to the few illegitimate situations, lawyers and judges are left to decide who the genuine experts are. To facilitate this often difficult process, lawyers and experts should be very meticulous regarding the presentation of their expert testimony

The Evolution from the Frye Test to the Daubert Test

Before any type of expert testimony is allowed in the courtroom, the presiding judge needs to determine if the testimony is relevant and should be admitted to the case. The method used today in determining whether the expert testimony is permissible came from the Supreme Court's decision in Daubert v. Merrel Dow Pharmaceuticals, Inc.²² Prior to this ruling, the most common and famous

¹⁴Judge Langlois Interview.

¹⁵McDowell, *supra* note 11, at 258.

¹⁶Andre A. Moenssens, *Handwriting Identification Evidence in the Post-Daubert World*, 66 UMKC L.Rev. 251, at 258.

¹⁷*Id.* at 259.

¹⁸*Id.* at 258.

¹⁹*Id.* at 259.

²⁰*Id.* at 259.

²¹McDowell, *supra* note 11, at 252.

²²Daubert v. Merrel Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993).

method for screening the reliability of scientific evidence was the now abandoned *Frye* Test of “general acceptance,” which was first articulated in 1923 by the United States Court of Appeals for the District of Columbia Circuit.²³

The *Frye* Test applied generally to applications of scientific evidence, and required that the theory behind the evidence is sufficiently established and has gained general acceptance in the particular field in which it belongs.²⁴ This method of requiring general acceptance in the relevant scientific community ensured that individuals giving opinions were the most qualified to determine the reliability and validity of new scientific techniques.²⁵ In this manner, *Frye* facilitated the efforts of district courts to determine the admissibility of scientific evidence. Since many trial judges possess neither the time nor the scientific or technical expertise of a background in scientific methodologies, the *Frye* Test assisted judges in their objective determinations by creating a higher threshold for the admission of scientific evidence.²⁶

Although the *Frye* Test set a standard for requiring “general acceptance” in the pertinent scientific community, historically there has been a relaxed approach to document expertise.²⁷ Prior to *Frye*, the testimony of document experts was already well grounded in precedent long before the general acceptance test was announced.²⁸ Therefore, the *Frye* Test was not needed to determine the admissibility of handwriting identification

testimony.²⁹

In 1993, in *Daubert*, the Supreme Court held that the Federal Rules of Evidence, which were adopted in 1975, overruled the *Frye* Test of “general acceptance.”³⁰ The Court unanimously concluded that expert testimony was no longer inadmissible merely because it had not gained general acceptance in the pertinent scientific field.³¹ Federal Rule of Evidence 403 provided:

“All relevant evidence is admissible, except as otherwise provided by the Constitution of the United States, by Act of Congress, by these rules, or by the other rules prescribed by the Supreme Court pursuant to statutory authority. Evidence which is not relevant is not admissible.”

Federal Rule of Evidence 401 provided:

“‘Relevant Evidence’ is defined as that which has ‘any tendency to make the existence of the action more probable or less probable than it would be without the evidence.’”

The *Daubert* court further stated that Rule 702, which governs expert testimony, does not establish “general acceptance” as an absolute prerequisite to admissibility.³² More-

²³*Frye v. United States*, 293 F. 1013 (D.C. Cir. 1923).

²⁴See *Frye*, 293 F. at 1014.

²⁵Judge Charles R. Richey, *Proposals to Eliminate The Prejudicial Effect Of The Use Of The Word “Expert” Under The Federal Rules Of Evidence In Civil And Criminal Jury Trials*, 154 F.R.D. 537, 545 (1994).

²⁶*Id.* at 546.

²⁷Moenssens, *supra* note 16, at 267.

²⁸*Id.* at 272.

²⁹*Id.* at 272.

³⁰*Id.* at 274.

³¹*Id.* at 275.

³²*Daubert*, 509 U.S. at 588.

over, the drafting history of the Rules makes no mention of *Frye*, and a rigid “general acceptance” requirement would be at odds with the “liberal thrust” of the Federal Rules and their general approach of relaxing the traditional barriers to expert testimony.³³

The *Daubert* court determined that under the Rules, it is the job of the trial judge to determine which evidence can be and cannot be admitted. He must ensure that any and all scientific testimony or evidence admitted is relevant and reliable.³⁴ Faced with a proffer of expert scientific testimony, the trial judge must determine at the outset, pursuant to Rule 104(a), whether the expert is proposing to testify to (1) scientific knowledge that will (2) assist the trier of fact to understand or determine a fact in issue.³⁵ “This entails a preliminary assessment of whether the reasoning or methodology underlying the testimony is scientifically valid and whether that reasoning or methodology properly can be applied to the facts in issue.”³⁶ The court was confident that trial judges possessed the capacity to undertake this review.³⁷

Judges vary in their opinions regarding what the impact of the Supreme Court’s ruling in *Daubert* is on the use of expert testimony. Commentators suggest that it is likely that a testimony’s acceptance will depend more on which judge is assigned at random to a case than any other factor, due to the amorphous nature of this test.³⁸ Nonetheless, although no definitive standards have evolved, there are informal suggestions that expert witnesses and lawyers should follow in order to make

the best possible presentation of their testimony.

Suggestions for the Presentation of Expert Witness Testimony

The trial judge has the threshold responsibility for ensuring that the expert witness called to testify provides relevant information that will assist the trier of fact. He has the power to direct the expert’s testimony toward a limited subject.³⁹ This power to choose and direct these subjects can be considered a derivative of his power to control the form of testimony, or as part of his general power to control the scope of direct examination.⁴⁰ The trial judge also must instruct the jury on the use of expert testimony. These instructions are a potentially powerful tool for dispelling the aura of expertise and for reminding the jurors of their responsibility as ultimate triers of facts.⁴¹ In many cases, the judge is careful to emphasize to the jury that they are not bound by expert testimony and may accept or reject it in whole or in part.⁴²

It should be needless to say that an expert witness should be well prepared when presenting testimony before the court. He should ensure that his testimony is pertinent and well founded. Expert testimony, which borders on the fantastic, or which is wholly incredible, undermines the integrity of the adversary session.⁴³ As such, he should review and practice the delivery of his testimony before trial. The preparation of a witness says as much about the witness as it does about the attorney.⁴⁴

³³*Id.*

³⁴*Id.* at 589.

³⁵*Id.* at 593.

³⁶*Id.* at 593.

³⁷*Daubert*, 509 U.S. at 593.

³⁸Judge Richey, *supra* 25, at 548.

³⁹James M. Doyle, *Applying Lawyers’ Expertise to Scientific Experts*, 25 Wm. & Mary L.Rev. 619, 638 (1984).

⁴⁰*Id.* at 638-639.

⁴¹*Id.* at 639.

⁴²Judge Langlois Interview; Judge Richey, *supra* 25, at 555.

⁴³Richmond, *supra* note 7, at 486.

⁴⁴Judge Langlois Interview.

The body language of the witness is extremely important; he should feel comfortable and confident when presenting testimony. Any feelings of discomfort revealed in the deliverance of his information may result in the trier of fact questioning the certainty and reliability of the information. It is also important that the witness maintains his professional demeanor throughout the proceedings; he must live up to the standard expectations of witnesses in his field. It is important for an expert witness to realize that he is not the only possible source of expert testimony. Therefore, he should provide strong, relevant information in an understandable manner. The testimony should be founded on the facts of the case and not just general information regarding the subject matter.⁴⁵

It is also very important that the expert witness keep the jury interested. In the boom of media sound bites and widespread litigation on television, jurors need to be given the pertinent information, but must also be entertained. An expert witness should be convincing and dynamic, two traits which are well established as an integral facet of a persuasive expert testimony.⁴⁶ Furthermore, while keeping the jury interested, the expert should also help the jury understand each element of what is being explained. The frustration of a judge or juror, who cannot understand the delivered testimony, will not work towards the client's benefit.⁴⁷

On the other hand, while an expert must take special care to ensure that the judge and jury

understand the testimony, he should not be arrogant or condescending in his delivery. This will quickly work to turn the trier of fact against him, despite the reliability of his information. Additionally, when being questioned by a judge or cross-examined by opposing counsel, he should not be combative. Combative responses during trial will only serve to weaken the expert's image.⁴⁸

An expert witness should also avoid being an expert on everything. An "expert" has developed knowledge of a particular subject that gives him the ability to prove an opinion that one without such knowledge could not provide.⁴⁹ To extend the scope of expertise across too many varying areas will, by definition, weaken the reliability of the testimony and cause the so-called expert to lose credibility before the judge and jury.⁵⁰

Along the same lines, an expert witness should not falsify his credentials. If caught by the judge, the witness will ultimately lose all credibility. In a particular malpractice case in California, a psychologist acting as an expert witness vaguely implied on his resume that he received his Ph.D. from the University of California at Berkeley. When the judge questioned him as to whether or not he attended the prestigious Berkeley institution, he responded in the negative. In fact, the witness had attended the Berkeley extension campus of a regional community college.⁵¹ Such misrepresentations, whether through deceit or confusion, will certainly undermine the testimony of an expert witness.⁵²

⁴⁵*Id.*

⁴⁶*Id.*

⁴⁷*Id.*

⁴⁸*Id.*

⁴⁹Black's Law Dictionary, 214 (Pocket Ed. 1996)

⁵⁰Judge Langlois Interview.

⁵¹*Ferroni v. United States*, 9th Circuit medical malpractice case before Federal Magistrate Bernard Zimmerman that took place from August 3-August 5, 1998, in the San Francisco Federal Court House.

⁵²Judge Langlois Interview.

Finally, an expert witness should not work exclusively for a particular institution. An expert witness should make efforts to balance the type of testimony he provides. If he takes a case as a plaintiff's witness, the next case should be as a defendant's witness. If he testifies for a hospital or institution, the next testimonial should be for a victim or individual. Such a balance among an expert's testimonies will strengthen his credibility as a truly objective witness and ensure that he is not labeled as a "gun-for-hire" in the litigation arena.⁵³

CONCLUSION

The use of expert witnesses is an important aspect of modern litigation. It should amount to more than just a "battle of the experts." Experts should always make it a point to present their testimony in a fair, even-handed manner. Ideally, their information should be presented objectively regardless of whether they are testifying on behalf of the plaintiff or the defendant. An expert should not be any party's advocate.⁵⁴ An expert witness should be an advocate of the truth with testimony that aides the court and the jury in reading the ultimate truth in the case, as should be the basis of any verdict.⁵⁵

Although under *Daubert* judges have the power to determine what is permissible evidence, most of them do not use its limiting power broadly, instead giving wide latitude when deciding whether or not to admit expert testimony.⁵⁶ Judges know that a party will suffer if its expert testimony is excluded. Thus, except in exceptional cases, they are reluctant to do so.⁵⁷ Under these conditions, and with the given suggestions, expert witnesses and judges can work together effectively in pursuing objective truths in the courtroom.

Presented at the 1998 NADE conference in New Orleans, La.

The Honorable Michael G. Bagneris, a native of New Orleans, was elected Judge of the Orleans Parish Civil District Court, Division "H" in 1993, and has served with distinction. In 1975, after receiving his J.D. from Tulane Law School, he became an associate of Fine & Waltzer, later renamed Fine, Waltzer & Bagneris in 1979. Additionally, from 1980 to 1986, Judge Bagneris was Executive Counsel to New Orleans Mayor Ernest "Dutch" Morial.

Numerous honors have been bestowed upon Judge Bagneris in his lifetime, beginning as a student. For example, at Yale University he received two B.A. degrees and was recognized as the most all-around student with the "Jonathan Sterling Trumbull Award." At St. Augustine High School, he graduated 4th in his class and received the prestigious "Purple Knight Award."

⁵³*Id.*

⁵⁴Richmond, *supra* note 7, at 486.

⁵⁵*Id.*

⁵⁶Judge Langlois Interview.

⁵⁷Stephen D. Easton, "Yer Outta Here!" A Framework for Analyzing the Potential Exclusion of Expert Testimony Under the Federal Rules of Evidence, 32 U. Rich. L.Rev. 1, 10 (1998).

PROVING PHOTOCOPY FORGERY TO THE JURY

by
Anthony McAloney, CDE

In this case (US District Court, Miami, Florida, case No. 1.98CR00398 before Judge Patricia A. Seitz) a document was shown to have been forged by photocopy. A method of proof was used successfully in defending against a claim by the National Forensic Laboratory and should, therefore, be understood by all private document examiners.

This was a criminal case of alleged tax fraud in which the defendant's accountant was found guilty, but the defendant claimed no knowledge of the illegal acts. The evidence on which the government linked complicity was a photocopy of a fraudulent letter (for which no original could be found), signed with the name of a fictitious person, and clearly written in the handwriting of the defendant.

The letter was marked Q-1 and a portion of it is shown in illustration #1. For comparison, the IRS Criminal Investigation Division had taken 26 pages of exemplars of the defendant Charles T. Kunkle writing the fictitious name *Thomas B. Seymor*. These matched in handwriting style and all details the signature on Q-1.

The author's intention was to prove to the jury that, in fact, someone had cut-and-pasted this signature from older documents of Charles T. Kunkle, using one document for the name *Thomas B.* and another for *Seymor*.

The method of proof used was as follows: Two (2) easels were placed before the jury with a poster enlargement of Q-1 on one of them. Each juror also had an 8.5"x11" copy.

The term *generation* was carefully explained to the jurors so that they understood that the first photocopy of an original is the first generation, a photocopy of the first generation copy is then the second generation, and so on.

The jurors were asked to examine Q-1 and to notice that the name *Seymor* on the document was extremely degenerated. The question now became, "How many generations would it take to make a signature degenerate to that extent?" It was explained to the jury that to answer that question, the examiner had taken the Gen-1 photocopy of one of the request signatures (supplied by the IRS Criminal Investigation Division) and had put it through generations.

A poster-sized enlargement of the Gen-31 photocopy of the request signature *Thomas B. Seymor* was placed on the second easel in front of the jury (See illustration #2).

The jury was asked to compare and verify that the name *Seymor* on both exhibits was equally degenerated. That is, the letters were mainly unreadable, the letter connections had disappeared, and the word matched the Q-1 writing only in the final two letters and in proportion and spacing.

The important point was that it took 31 generations to get the documents to match. A set of photocopies had been prepared for each juror containing the various generations of copies in order, but the objections of the prosecution kept these out of the hands of the jurors. The case continued with the poster-sized exhibits.

The author explained that there was a problem with Gen-31. The jury was asked to notice that the first name *Thomas* on Gen-31 was degenerated much more than the *Thomas* on Q-1. To find a match in condition for *Thomas*

Sincerely,


Thomas B. Seymour
Staff Accountant
Payroll Accounting

John A. Syme

XXXXXXXXXX,
Thomas E. Seymour
 XXXXXX X. XXXXXX
 XXXXXX XXXXXXXXXXXX
 XXXXXXXX XXXXXXXXXXXX

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on Q-1, it was necessary to look through the entire set of photocopy generations for the same condition.

An enlargement of Gen-11 was put on the easel next to Q-1 (illustration #3). This matched the condition of *Thomas* on Q-1 because each letter was correctly formed and readable, with letter connections still show-

ing. A marker was used to write "31" under the *Seymor* and "11" under the *Thomas* on the Q-1 enlargement.

The jury was then informed that the same photocopying procedure of making 31 generations of copies was repeated on three different brands of copy machines: Canon, Xerox and Lanier, with identical results.

SAMPLE ORIGINAL CREATED FOR DEMONSTRATION PURPOSES

May 14, 1993

Mr. Charles T. Unkle
P.O. Box 4733
Princeton , FL. 33092

Dear Mr. Unkle ;

Pursuant to your request for information from your employment files, Please be advised that the disability policy premiums for which you received benefits from 1989 through 1991 were paid throught regular payroll deductions.

If we can be of further assistance please do not hesitate to contact this office.

Sincerely,

Thomas B. Seymor
Staff Accountant
Payroll Accounting

Illustration #4

It was then explained that if one had an original of Q-1 (remember that in this case, Q-1 itself is a photocopy), the same operation could have been done to find out how many generations it would take to make the printing match the condition of the printing on Q-1. Since we did not have an original typed Q-1 document, the author prepared one for testing.

The next exhibit introduced was a freshly printed, unsigned original of Q-1 which had been retyped and printed out on a laser printer and on an older impact printer (See illustration 4).

An 8.5" x 11" set of the Gen-1 through Gen-7 copies of this document had been prepared for each juror. This time the copy sets were accepted as evidence and handed to the jury. After the jurors had the opportunity to look at these seven copies the author asked them to look carefully at Gen-5 to see that it most closely matched Q-1. The printing on Gen-6 was more degraded than that on Q-1. A "5" was written next to the typed salutation on the enlargement of Q-1 to indicate that the printed part of the questioned document matched the printing on the known fifth-generation photocopy.

With all of the evidence of these tests now before the jury, it was explained that if time were reversed and the document Q-1 were taken back to its origination, then it would take only five steps to get back to the original of the printed matter on the document, but it would take 11 steps to get back to the original of *Thomas* and 31 steps to get back to the original of *Seymor*. This demonstration proved BEYOND A REASONABLE DOUBT that Q-1 was a photocopy fraud using two separate older documents and was not signed by Charles T. Kunkle or any other individual.

As in all criminal cases there were many objections and sub-plots between the prosecutor and defense attorneys. While reading this article may take thirty minutes, the actual time for the testimony was a total of five hours over two days. The author left the courtroom when the testimony was completed and learned later in the day that the defendant was found "not guilty."

Anthony R. McAloney, CDE, does business as Florida Handwriting Consultant. Previously, he was Fifth Avenue Handwriting Consultant in New York City for over 25 years. He is a fellow of the Board of ACFE and Chairman of the Certification Committee of NADE. He is also retired from the NYC law firm of Wilson, Elser, Moskowitz, Edelman & Dicker after 32 years as recovery manager and resident document examiner. His phone number is 561-638-1516.

Forensically Speaking

by
Phyllis Cook, B.S., BCFE,
Diplomate

+ Ancient documents are documents generally more than 30 years old.

+ Foster and Freeman has added another instrument to aid document examiners. It is a benchtop spectrometer that measures and compares the Raman spectra of inks present on a document. A Raman effect occurs when light interacts with the materials it strikes and is then reflected at an altered wavelength. The emitted wavelengths make up the Raman spectrum.

+ In 1997 the Federal Bureau of Intelligence declared forgery to be a violent crime.

+ A Federal Bill was passed (Senate Bill 512 and HR companion bill 3601) making forgery punishable by a \$1000 fine and/or 20 years in prison.

+ In penmanship, finger movement produces a "push and pull" quality, and hand/wrist movement produces a rhythmic flow.

+ Wilson R. Harrison has said in *Suspect Documents* that short blasts of ultraviolet light are more detrimental to documents than months of daylight.

+ The following methods are sometimes used to make forged documents look old: smoking or burning the paper, exposing the document to sunlight, placing the document in high humidity, dirtying the paper, spraying on water, heating in an oven.

+ TDI Library Services will quickly research topics and provide you with copies via fax or

mail. Their fees are reasonable and they can help with supporting documentation. TDI Library Services, Inc., 2118 Wilshire Blvd., Suite 787, Santa Monica, CA 90403-5784. Phone 310-820-3651; fax: 310-826-3932. Email: tdicolib@ix.netcom.com

+ The Doar Litigation Support Center has a staff of graphics professionals to assist you with exhibits. They can give turnaround as fast as 4 hours. Phone: 800-875-8705, ext.123, or Website: www.DOAR.com

+ Palimpsest (from the Greek word *palimpsestos* meaning "rubbed again"): a parchment, tablet, etc., which has been written upon or inscribed two or three times, the previous text or texts having been imperfectly erased and remaining still partly visible. — New World Dictionary of the American Language, 2nd College Edition, Simon & Schuster, 1986.

JOURNAL OF THE NATIONAL ASSOCIATION OF DOCUMENT EXAMINERS

Submission Guidelines. The editors wish to thank Marcel Matley for his work in writing the first version of these guidelines.

Types of Papers Accepted:

1. Research papers report original, primary research in any area of QDE.
2. State of the Art Reviews survey the published literature on a specific topic in the field of QDE.
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6. OpEd (Opinion/Education) pieces set forth an opinion, pose a question, or inform about some aspect of QDE.

All papers must include references to support assertions and must present some information or viewpoint regarding some aspect of QDE which would be of value to readers.

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1. Send four (4) printed copies and one (1) 3.5" diskette with either an ascii file, text file, Microsoft Word file, or Word Perfect file of the paper to Emily Will, Editor. Alternatively, submissions may be sent via email to qdewill@mindspring.com
2. As part of the above, submit one camera-ready print copy or electronic file of each exhibit or illustration you intend to have in this paper. If you desire to submit illustrations electronically, contact the editor in advance to discuss format. Each illustration should have a figure number by which it is referred to in the paper, and a caption or text which succinctly identifies it and states its purpose.

3. Deadlines for the Summer and Fall and Winter 1999 issues are April 15, July 15, and Nov.1 respectively.

4. It is highly recommended that you begin the process of writing your paper by discussing the potential for publication with one of the editors via email, telephone or letter. Contact information can be found at the front of the journal. This discussion will take the place of submission of an abstract.

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Authors may in general follow any standard style manual. That published by the U.S. Government Printing Office is recommended, since it is regularly up-dated and readily available. Papers should, however, have these features:

1. Title of the paper centered at top
2. Name(s) of author, and if multiple, the one(s) who will deal with the Editorial Board should be clearly indicated.
3. A brief professional bio of the author including degrees, certifications and relevant professional information.
4. The paper should have clearly demarcated sections. There are no rigid requirements in this regard, only that it should be logically developed and helpful to the reader.

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